CLAIMS

What is claimed is:

1. A method of operating a jet engine on a mobile platform having at least one lift-producing surface, the method comprising:

using the engine to generate an exhaust flow;

controllably moving at least a nozzle of the engine into a corresponding one of a plurality of configurations including at least:

a first configuration in which the exhaust flow is directed to flow across an upper surface of the lift-producing surface to provide upper surface blowing;

a second configuration in which the exhaust flow is discharged to flow generally downstream; and

the engine being disposed relative to the lift-producing surface such that the exhaust flow does not provide upper surface blowing when the second configuration is used.

2. The method of claim 1, wherein:

the nozzle comprises a thrust vectoring nozzle; and

controllably moving at least the nozzle of the engine comprises controllably moving the thrust vectoring nozzle..

3. The method of claim 2, wherein the thrust vectoring nozzle is faired when the second configuration is used.

4. The method of claim 1, wherein controllably moving at least the nozzle of the engine comprises controllably rotating the engine relative to the lift-producing surface.

5. The method of claim 1, wherein:

the mobile platform comprises an aircraft; and

the lift-producing surface comprises a wing.

6. The method of claim 5, further comprising:

using the first configuration during a high-lift phase of operation of the aircraft; and

using the second configuration during a cruising phase of operation of the aircraft.

7. The method of claim 5, wherein the engine is sufficiently above and ahead of the wing such that the exhaust flow does not contact an upper surface of the wing when the second configuration is used.

8. The method of claim 5, wherein the engine is disposed sufficiently above and ahead of the wing so that performance of the aircraft is unaffected by surface scrubbing of the exhaust flow across an upper surface of the wing when the second figuration is used.

9. The method of claim 1, further comprising causing the exhaust flow to laterally diffuse.

10. An aircraft, comprising:

a wing having an upper surface;

a jet engine including a thrust vectoring nozzle;

the nozzle being controllably movable into a corresponding one of a plurality of configurations including at least:

a first configuration in which the nozzle is positioned to direct an exhaust flow across the upper wing surface to provide upper surface blowing to augment lift;

a second configuration in which the nozzle is positioned to discharge the exhaust flow generally downstream; and

the engine being disposed relative to the wing such that the exhaust flow does not provide upper surface blowing when the nozzle is in the second configuration.

11. The aircraft of claim 10, wherein the nozzle is faired in the second configuration.

12. The aircraft of claim 10, wherein the nozzle is adapted to cause lateral diffusion of the exhaust flow.

13. The aircraft of claim 12, wherein the nozzle includes a generally oval shaped cross-section.

14. The aircraft of claim 10, wherein the engine is disposed sufficiently above and ahead of the wing such that the exhaust flow does not contact the upper wing surface when the nozzle is in the second configuration.

15. The aircraft of claim 10, wherein the engine is disposed sufficiently above and ahead of the wing so that aircraft performance is unaffected by surface scrubbing of the exhaust flow across the upper wing surface when the nozzle is in the second configuration.

16. An aircraft, comprising:

a wing having an upper surface;

a jet engine rotatably supported to supporting structure of the aircraft;

the engine being controllably rotatable relative to the wing into a corresponding one of a plurality of configurations including at least:

a first configuration in which the engine is rotated to discharge the exhaust flow across the upper wing surface to provide upper surface blowing to augment lift;

a second configuration in which the engine is rotated to discharge the exhaust flow generally downstream; and

the engine being disposed relative to the wing such that the exhaust flow does not provide upper surface blowing when the engine is in the second configuration.

17. The aircraft of claim 16, wherein the engine is faired in the second configuration.

18. The aircraft of claim 16, wherein the engine includes a nozzle adapted to cause lateral diffusion of the exhaust flow.

19. The aircraft of claim 18, wherein the nozzle includes a generally oval shaped cross-section.

20. The aircraft of claim 16, wherein the engine is disposed sufficiently above and ahead of the wing such that the exhaust flow does not contact the upper wing surface when the engine is in the second figuration.

21. The aircraft of claim 16, wherein the engine is disposed sufficiently above and ahead of the wing so that performance of the aircraft is unaffected by surface scrubbing of the exhaust flow across the upper wing surface when the engine is in the second figuration.

22. A method of operating a jet engine on a mobile platform having at least one airfoil, the method comprising:

using the engine to generate an exhaust flow;

controllably vectoring the exhaust flow depending on a phase of operation of the mobile platform, the controllably changing including:

vectoring the exhaust flow to flow across a surface of the airfoil to provide surface blowing to augment aerodynamic force generated by the airfoil during a first phase of operation of the mobile platform;

vectoring the exhaust flow to flow generally downstream during a second phase of operation of the mobile platform; and

the engine being positioned relative to the airfoil such that the exhaust flow does not provide surface blowing when the exhaust flow is vectored to flow generally downstream.

23. The method of claim 22, wherein the controllably vectoring comprises controllably moving a thrust vectoring nozzle of the engine.

24. The method of claim 22, wherein the controllably vectoring comprises controllably rotating the engine relative to the airfoil.

25. The method of claim 22, further comprising causing the exhaust flow to laterally diffuse.

26. The method of claim 22, wherein the mobile platform comprises an aircraft, and the aerodynamic force comprises lift.